

**THE QUESTIONS OF THE TEACHER AND THE STUDENTS AND THE  
PROBLEMS IN INSTRUCTION**

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**Abstract:** When teaching nature and society, the teachers face many cognitive challenges. They are mostly related to what the students know, think they know and what they need to offer as a solution to something that they do not know. This means that the students who have a gap between their previous knowledge and the material that they need to learn face problems.

The cognitive contradictions are solved on the grounds of the previous knowledge of the students, their life experience, and what they have learned in activities such as independent cognition, individual learning (studying), self-guidance, research, etc. When solving a problem, the degree of independence of the elementary school students is relatively low. Help and guidance by the teachers is necessary.

The Polish didactician W. Okon tried to present the complete matter regarding the didactic problem in the form of a practical or theoretical difficulty, which the students can overcome through their own research. (according to Krneta, Lj., 1970, 570)

This kind of problem in the instruction can be a real turning-point in the concept and realization of specific processes in the instruction. It can change its notion and meet numerous demands and tasks related to the instruction and the individuals. It is a system of instruction which is radically different from the adequate characteristics and functions of other instructional systems. As a complete instructional system it includes several methods, activities and means of instructional work and it results in a completely changed role of the teachers and students, for the group and each person individually.

The essence of this educational system can be understood and expressed through the identification and grouping of several characteristics and components.

**Key words:** research, principles, excitement, desire, experience, rules

The so-called discovery learning is very prominent in the efforts to improve instruction

in terms of development of the cognitive independence and the creative thinking of the students, as well as in their transformation from objects to subjects in the education.

The problem is a subjective experience of some form of opposition (contradiction, conflict, contrast) between the subject and the object, which comes in the form of a relationship between the known and unknown, the listed and the unlisted, the discovered and the undiscovered, the accomplished and the unaccomplished, the direct and indirect, the certain and the uncertain in the cognition process (According to Encyclopedia of Pedagogy II, 1988, 254).

The existence of problems is always a shortcoming for the learner, i.e. the subject. It is lack, emptiness, an obstacle, and negativity, which during instruction arise the cognitive-emotional excitement, a kind of spiritual unrest and desire to settle this opposition in one's own favor, thus attaining spiritual peace.

When teaching nature and society, there are many cognitive challenges. They are mostly related to what the students know, think they know and what they need to offer as a solution to something that they do not know. This means that the students who have a gap between their previous knowledge and the material that they need to learn face problems.

The cognitive contradictions are solved on the grounds of the previous knowledge of the students, their life experience, and what they have learned in activities such as independent cognition, individual learning (studying), self-guidance, research, etc. When solving a problem, the degree of independence of the elementary school students is relatively low. Help and guidance by the teachers is necessary.

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### **Problem based instruction**

The problems in instruction can be a real turning-point in the concept and realization of specific processes in the instruction. This can change the notion of the instruction and meet numerous demands and tasks related to the instructional process and the individuals. This is a system of instruction which is radically different from the adequate characteristics and functions of other instructional systems. As a complete instructional system it includes several methods, activities and means of instructional work and it results in a completely changed role of the teachers and students, for the group and each person individually.

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Primarily this refers to the fact that this instructional system, unlike others, starts from the emphasized changes in the instructional objectives and tasks, towards which this system of work is orientated and focused on. The goal is not only to acquire knowledge (create notions, rules, principles and other generalizations), but most of all to connect the knowledge. The processes, ways, methods, abilities, the intellectual operations and the other models of activities for acquiring scientific knowledge are stressed in this model. The development of thinking, the essential abilities of the culture for independent work, the abilities to do research work, the creation of different practical and theoretical problems, etc. become the direct tasks.

For these reasons, it is not a coincidence that in the objectives in the problem based instruction special attention is paid to forming the students' abilities to notice, feel, separate and set problems (questions), as well as to form abilities to solve them on their own. In this function, J. Bruner said that discovery learning (research) stimulates the intellectual potential of the students to use information to solve problems, increases their inner motivation and that it stimulates the students to acquire autonomous and self-developing functions. Discovery learning supports the development of their intuitive and analytical thinking, as well as the development of emotions and will (Bruner, J., 1976, 286). According to this, the essence of the problem based instruction is to meet these needs and to create conditions for changing the type of activities of the students and teachers in the instructional and learning processes.

In the problem based instruction there are very important changes in the organization of specific instructional processes. The instructional system in our usual educational practice is founded and carried out on the grounds of transfer of knowledge to the students in ready-made form. In the problem based education, the students find themselves in a situation, relatively independently to set and solve different theoretical and practical problems, i.e. to acquire cognitions, activities and methods, which are objectively familiar in science, and subjectively unfamiliar to the students. Because of this, problem based instruction is a system that is founded not only on the laws of memorizing (a characteristic of the usual instructional practice) but primarily on the laws of thinking. The central idea is that the process of thinking comes primarily in the form of a process of solving problems and that the laws of thinking and the processes of acquiring knowledge largely correspond. S.L. Rubinstein said that "each intellectual process in each internal structure is an activity or an act aiming to solve a task...Thinking usually starts with a problem or a question. It starts with amazement or lack of understanding, or by a contradiction" (Rubinstein, S.L., 1950, 53).

The researchers and supporters of the problem based education start from the premise that people start thinking when they need to understand something, to overcome some difficulty, when they find themselves in a problem situation. In this sense, the problem based education is founded on these laws. It restructures the activity of the student – from activity of acquiring ready-made knowledge and solving tasks with the acquired knowledge into an activity of setting problem tasks and using different activities for their understanding and solving, which at the same time results in acquiring knowledge, skills and other models.

The basis of the problem based education lies in the didactic problem, whose essence is the contradiction between the student's knowledge, methods and activities and the demands set by the task or question (the previous knowledge and skills of the student being crucial for its solving). This contradiction between the familiar and the unfamiliar, the listed and the unlisted, the implicit and the explicit, is the moving force of learning and instruction, and this is the real importance of the instructional problem\*. In the pedagogical and psychological literature there is no unity in the explanation of the essence of the didactic problem and the relations with the instructional tasks and instructional questions.

For example, W. Okon stresses that the term task has many meanings, and he compares it to the term – problem. M.N. Skatkin wrote about the cognitive tasks in the form of problems. The opinion of I.J. Lerner is very interesting. According to him, the tasks can be of research character or not. The latter mainly have a reproductive character and they can be solved directly by applying the knowledge, skills and habits that the students are familiar with. However, the tasks of research character are characterized by the fact that the way to their solving is unknown, and that the existing knowledge and models are insufficient. Hence the conclusion that not all tasks are problem based, but only a part of them, which according to his terminology are of research character and are related to the contradictions and difficulties that the students face, as well as to the insufficiency of the existing knowledge, skills and activities for their successful solving (Damjanovski, A. 1989, 139).

The problem based instruction has a special structure which is radically different from the structure of the other instructional systems. It determines the activities of the teachers and students. Dewey, when setting the grounds of the project, i.e. the problem based method, paid special attention to this question, and starting from the flow of the scientific-research work, he described the global structure of the instructional process in five stages: 1. Observing and noticing the difficulty – the problem; 2. Defining the problem; 3. Designing possible solutions – hypotheses; 4. Checking the hypotheses and acquiring adequate experience; 5. Acceptance

or rejection of the hypotheses (Dewy, J., 1934, 269 – 270).

For M.I. Mahmutov, the entire cycle of intellectual operations – from the occurrence of the problem situation to the solving of the problem – has several stages: occurrence of a problem situation, discovering the essence of the difficulty and setting or encouraging assumptions and well-based hypotheses, proving the hypotheses and checking whether the solution of the problem is correct (Mahmutov, I.M., 1977, 30-31).

According to L. Bognar, discovery learning, i.e. learning through one's own experience covers the following stages:

1. Defining the problem, asking questions, dilemmas, conflicts between the known and the unknown;
  - Thinking about possible solutions (brainstorming), setting hypotheses.
2. Acquiring knowledge from the direct surrounding (observations, experiments, monitoring, acquiring and analyzing data);
3. Making conclusions, acceptance and rejection of hypotheses, systematization, new questions, dilemmas, activities for changing the reality (Bognar, L., 1988, 589).

We can find similar approaches by other researchers of the problem based instruction. Their analysis mainly leads to the fact that the problem based education mainly includes frequently mentioned but sometimes differently interpreted structural elements: 1. creating a problem situation; 2. noticing the problem in the problem situation; 3. formulating the problem; 4. planning the solution and setting specific hypotheses; 5. solving the problem, proving or rejecting the specific hypotheses; 6. Making conclusions and assessment.

Depending on the character of the problem situations, the training of the students for solving problems and the diverse relationships between the teachers and students when solving problems result in a changed order and relationships, as well as diverse micro-structure of work on specific types and difficulties of the problems. "This means that solving a specific problem is not usually carried out according to a model with different order of stages and activities. The logical order of the stages and activities does not take place easily, in a uniform way, but rather the students start from the end, or the middle, go back to the beginning, move slower or faster, move on or go back, change the direction or the order, and it can also happen that they skip, or omit specific stages and arrive to the solution" (Gorgevic, J., 1981, 195-196).

In this whole cycle of activities, the questions for the ways to create a problem situation receive a prominent place.

Problem based instruction can have different levels of difficulty, and depending of the coordination of the teachers and students (individual, group and joint), it can take many forms and models.

Therefore, this type of problem based instruction and the level of difficulty most comprehensively reflect the essence, also creating basis for authentic and consistent realization of the complex didactic function. In this activity, the independent, creative activities of the students are predominant, regardless of the existence of many degrees of independence and creativity. The understanding and using of problem based education in this form also creates opportunities for instruction to get increasingly construed by creative elements, specific characteristics, abilities and models of creative actions to be encouraged in the students, as well as to achieve a real balance and an adequate efficient transfer from reproductive towards creative work of the respondents.

This approach in the interpretation of the essence of the problem based education and the different ways for its application set new tasks to the teachers and provide them with a new role. Their managing role is radically changed and redirected. It is directed mainly towards creating problem situations and helping the students understand the problems and feel a need to participate. It also implies that the teachers encourage searching and researching activities, that they help the students understand, conclude and test; finally they need to provide the needed materials, sources of knowledge and build positive working atmosphere. In the problem based instruction, the teachers manage the interaction between the object (the problem) and the subject of cognition (the student), in a way that is helpful, leading and that creates conditions for the students to learn and understand the object and to acquire new ways and abilities for designing solutions. According to this, at any degree of realization of the problem based instruction, the teacher is the link between the object of study (the problem) and the cognitive subject (the student).

### **Conclusion**

It is a dynamic relationship, i.e. the role of the teacher is not static, but on the contrary, it is very dynamic, subject to continuous change and adaptations. In the first stage, when the students have no knowledge and developed skills for independent setting, planning and solving specific problems from different nature, the guidance provided by the teacher is more prominent and expressed through the transfer of the needed information, the training of the students to ask questions, and the instruction about specific ways of problem analysis,

planning and solving, as well as the guidance for using algorithmic and non-algorithmic instructions. Later on, depending on the gradual progress of the students, they can notice and form problems (questions) on their own, and use all of the important activities for solving problems, etc. The emphasized and more direct guidance gradually receives the characteristics of an indirect than a direct one. It is more stimulating. Its purpose is more organizational than content-orientated in the sense that it helps the students to actively use their previous knowledge and abilities to find the answers to the questions. According to this, the degree and character of guidance of the students in the problem based instruction will undergo continuous changes and take into consideration the character and the degree of difficulty of the problems and the preparedness of the students to notice and solve the problems on their own.

In this sense, Vitrok stated that instruction in discovery learning has four functions: 1. to help the students understand and identify the demands that are necessary for the successful solving of the problem; 2. the students will understand and identify the important elements in the problem situation; 3. the students will discover and develop the proper direction in learning; 4. to guide the thinking process of the students who solve problems (According to Kvashev, R., 1974, 291).

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